

COMPARATIVE BATHING BEHAVIOR IN SOME AUSTRALIAN BIRDS

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Abstract.—The bathing behavior of Alcedinidae (2 species), Dicruridae (1), Meliphagidae (16), Meropidae (1), Muscicapidae (5) and Zosteropidae (1) is described and compared with that of other species. The birds were observed from a blind while they bathed in a water hole with a sloping shore line and flanked on one side by shrubs. Two forms of bathing were noted: diving from shrubs and wading into shallow water. Although more data are needed, it is suggested that the bathing methods used by birds differ at the generic level and not necessarily at the family level.

ESTUDIO COMPARATIVO DE LA CONDUCTA DE BAÑARSE POR ALGUNAS AVES AUSTRALIANAS

Sinopsis.—Se describe y compara la conducta de bañarse de Alcedinidae (2 especies), Dicruridae (1), Meliphagidae (16), Meropidae (1), Muscicapidae (5) y Zosteropidae (1) con la de otras especies. Las aves se observaron desde escondijos mientras se bañaban en un ojo de agua flanqueado en un lado por arbustos. Se notaron dos formas de bañarse: tirándose en clavado desde un arbusto y andando o brincando desde la orilla hacia agua de poca profundidad. Aunque se necesitan más datos, sugiero que el método de bañarse utilizado por las aves difiere a nivel de género y no necesariamente a nivel de familia.

Although some forms of feather maintenance behavior have been studied in detail (e.g., preening, Hatch et al. 1986, Iersel and Bol 1958) others (e.g., bathing) are rarely mentioned in the bird literature (Burt 1983). As most feather maintenance activities occur infrequently and unpredictably and are often of short duration, they are difficult to study systematically. Simmons (1964) and Slessers (1970) reported on the different bathing techniques of birds and made the first attempts to compare and interpret them in terms of morphology and ecology. The observations here reported show that these interpretations may have to be modified.

METHODS AND RESULTS

On 9–17 Dec. 1988 I observed birds from a blind pitched at a human-made water hole on the Quaalup Homestead, an enclave in Fitzgerald River National Park, W.A., Australia. The water hole had a gently sloping, sandy shore; a water surface at the time of the study of 14 × 17 m and was located in a woodland dominated by *Eucalyptus occidentalis* with an understory of *Acacia cyclopis*. Along one side shrubs and small trees grew near the water's edge and a few branches of larger trees hung over the water hole. Bird nomenclature follows Slater et al. (1988).

The birds showed two kinds of bathing behavior. Some species walked or hopped into the shallow water along the shore, others variously dove into or onto the water, 3–5 times per bath. Among the honeyeaters, Red Wattlebirds (*Anthochaera carunculata*) ($n = 96$) dove from an estimated

height of (mean \pm SD) 1.8 ± 0.7 m ($n = 12$) from perches in shrubs along the shore or from tree branches hanging over the pond. They entered head first, 1.5 ± 1.0 m ($n = 12$) from the shore, and at times were momentarily submerged. The birds perched following each dive, shook their feathers, hastily preened and bill-clapped. White-naped Honeyeaters (*Melithreptus lunatus*) ($n = 25$) dove from a height of 1.8 ± 0.8 m ($n = 12$), entering the water 2.5 ± 1.1 m ($n = 11$) from shore, often submerging completely and floating briefly before returning to a perch. The degree of submergence, as was the case in Red Wattlebirds, appeared dependent on the number of dives because on the first dive the birds just hit the water with a splash, being apparently too buoyant to go under. The five times I saw Western Spinebills (*Acanthorhynchus superciliosus*) dive, their behavior was very similar to that of Red Wattlebirds and White-naped Honeyeaters. There appeared to be a dichotomy among the honeyeaters. The three species of honeyeaters mentioned above dove from heights of 1.5 m or more while Brown (*Lichmera indistincta*) ($n = 29$) and Singing Honeyeaters (*Lichenostomus virescens*) ($n = 2$) perched lower (<80 cm) and dropped into the water closer (<50 cm) to the shore. The latter two species appeared more cautious when bathing than the others, staying close below or near the only shrub that hung partly over the edge of the waterhole. For both species the distance between the perch and the water surface was too short to allow them to submerge upon impact. Brown Honeyeaters dropped almost vertically to the surface of the water, briefly floated and splashed and hurried back to the shrubs. Besides the honeyeaters mentioned, Restless Flycatchers (*Myiagra inquieta*) ($n = 2$) dove boldly, resembling White-naped Honeyeaters. Sacred Kingfishers (*Halcyon sancta*) ($n = 6$) dove from low perches (<50 cm) while Rainbow Bee-eaters (*Merops ornatus*) ($n = 7$) dove from a flight over the waterhole.

Unlike other honeyeaters, Tawny-crowned Honeyeaters (*Phylidonyris melanops*) ($n = 3$) approached on foot and bathed standing in shallow water. The congeneric New Holland Honeyeater (*P. novaehollandiae*) ($n = 76$) hopped towards the water's edge from branch to branch and then jumped onto the shore or into the shallow water from a height of 0.3 ± 0.1 m ($n = 23$). When New Holland Honeyeaters bathed together (up to 12 birds), which they tended to do, most of them dispensed with descending through the branches and instead moved directly to the water's edge over the ground. Silvereyes (*Zosterops lateralis*) ($n = 75$) approached the water the way New Holland Honeyeaters did. They appeared nervous, jumped in and out of the water and barely got wet. Unlike Restless Flycatchers, Willy Wagtails (*Rhipidura leucophrys*) ($n = 9$) and Grey Fantails (*R. fuliginosa*) ($n = 5$) bathed by standing in shallow water near or away from the shrubs as if cover were unimportant to them. They bathed in one continuous session rather than interrupt it by going back to shore several times as did all the other species.

The gently sloping shore as well as the nearby shrubs offered the full range of possibilities to enter the water, so it seems reasonable to assume that each species performed as it did by choice. In situations where nearby

shrubs, overhanging branches and/or water that is shallow enough to stand in are absent the species perhaps may bathe differently. Whether they have the behavioral flexibility to do so I do not know, but I doubt it.

Besides the species mentioned. I have seen bathing in other Australian birds elsewhere. All the additional species dove from perches: Yellow-faced Honeyeater (*Lichenostomus chrysops*) (see also Waterhouse 1946), White-plumed Honeyeater (*L. penicillatus*) (Immelmann 1961, Perry 1946), White-gaped Honeyeater (*Meliphaga unicolor*) (Immelmann 1961), Black-chinned Honeyeater (*Melithreptus gularis*), White-throated Honeyeater (*M. albogularis*), Noisy Miner (*Manorina melanocephala*), Blue-faced Honeyeater (*Entomyzon cyanotis*), Silver-crowned Friarbird (*Philemon argenticeps*), Little Friarbird (*P. citreogularis*), Spangled Drongo (*Dicrurus megarhynchus*), Satin Flycatcher (*Myiagra cyanoleuca*), Leaden Flycatcher (*M. rubecula*) and Forest Kingfisher (*Halcyon macleayii*). Immelmann (1961) reported diving in five additional species of honeyeaters and Waterhouse (1946) mentions the Eastern Spinebill (*Acanthorhynchus tenuirostris*). Immelmann's (1961) statement that apparently only small honeyeaters dive is incorrect, as I saw diving in such large species as Red Wattlebird, Silver-crowned Friarbird and Blue-faced Honeyeater.

DISCUSSION

Why some birds bathe while standing in shallow water, whereas others dive, is unclear. Slessers (1970) concluded that "anatomical structure and habits" mainly dictated the method of bathing. For instance, aerial birds such as swallows and swifts bathe on the wing because their legs are too short and weak and their wings too long to bathe while standing in water (Slessers 1970). It is difficult to see, however, how anatomy contributes to bathing by diving as found in tyrannid flycatchers (Eastern Phoebe (*Sayornis phoebe*), Eastern Wood Pewee (*Contopus virens*) (Slessers 1970), Willow Flycatcher (*Empidonax traillii*) (Burt 1983) and Fork-tailed Flycatcher (*Muscivora tyrannus*) (Lamar 1983) and muscicapid flycatchers (Leaden, Restless and Satin Flycatcher, this study). These birds habitually dive on their insect prey in the air and their diving into water to bathe might be a likely extension of their feeding behavior. The same argument may apply to bee-eaters, among which several species are reported to dive into water (Fry 1982, Reynolds 1975, this study), and drongos. Inconsistent with this argument is that two other muscicapid flycatchers (Willy Wagtail and Grey Fantail) bathe by standing in water. Their erratic pursuit flights after insects, involving aerial twists and turns, do not extend logically into diving into water. Are they too light? Then there are the many honeyeaters (Immelmann 1961, Perry 1946, Waterhouse 1946, this study), Red-eyed Vireo (*Vireo olivaceus*) and Indigo Bunting (*Passerina cyanea*) (Slessers 1970), that dive to bathe and are not obviously hampered by anatomy or feeding behavior to do otherwise. Although long-billed honeyeaters take insects by hawking (Ford and Patton 1976), in which habit they could be, for purposes of this paper,

loosely equated with flycatchers, short-billed honeyeaters primarily glean insects, yet they dive into water just as well as the long-billed species.

Although more data are needed, it is tempting to suggest that taxonomically, the various bathing methods shown by birds differ at the generic level, not necessarily at the family level. Among honeyeaters, the genera *Acanthorhynchus*, *Anthochaera*, *Entomyzon*, *Lichenostomus*, *Lichmera*, *Manorina*, *Meliphaga*, *Melithreptus* and *Philemon* dive, while *Phylidonyris* stands to bathe. The fact that the genus *Phylidonyris* is an apparent exception needs further study. Similarly, among the muscicapid flycatchers, *Myiagra* dives and *Rhipidura* stands to bathe.

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